

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant: Pontanari, et al.  
Serial Number: 10/543,080  
Filed: July 20, 2005  
Art Unit: 3681  
Examiner: Knight, Derek Douglas  
Title: Electronic Differential Lock Assembly  
Conf. No. 2571

Mail Stop Appeal Brief-Patents  
Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**REPLY BRIEF**

Dear Sir:

Responsive to the Examiner's Answer dated May 26, 2009, please consider the following remarks. The appeal brief fee has already been paid. Any additional fees or credits may be charged or applied to Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds.

**REMARKS**

Appellant respectfully reiterates all of the arguments made in the Appeal Brief and in previous Office Action responses to address the Examiner's Answer. Additional arguments, prepared in response to new issues raised in the Examiner's Answer, are set forth below.

## **ARGUMENT**

### **A. Obviousness Rejection – Keller and Petzold**

Claims 1-10, 12-20, 24, 25, and 27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Keller (US 5030181) in view of Petzold (US 6886425).

#### **Claim 1**

Claim 1 requires a shift collar that directly engages a differential case when in a locked position. The examiner argues it is clear that the differential case of Keller is assembled from two pieces 24 and C. Appellant respectfully asserts that element 24 does not comprise a differential case as defined in the claim. Element 24 comprises a clutch wheel with a hub 23 that engages with a sliding sleeve 18. The clutch wheel 24 does not comprise a differential case and one of ordinary skill in the art would not consider clutch wheel 24 as corresponding to the claimed differential case.

Claim 1 also recites the feature of a resilient member that surrounds an outer end portion of the shift collar. The examiner argues that replacing the spring of Keller with the spring of Petzold is merely a simple substitution of one known method with another that would be obvious to try because predictable results would have ensued. Appellant respectfully disagrees.

Claim 1 recites that the resilient member surrounds an outer end portion of the shift collar. Keller clearly discloses a spring 26 that engages an end face of the shift collar and an opposing end face of the hub 23. The spring 26 does not surround an outer end portion of the shift collar. Petzold also does not disclose a resilient member that surrounds an outer end portion of the shift collar.

The plate spring 46 of Petzold is centrally located on a shift dog. There is no teaching of mounting a spring to surround an outer end portion of a shift collar as defined in the claim. Further, Petzold teaches reacting the plate spring 46 between disc 22 and electromagnetic device 40.

The examiner argues that it would be obvious to modify Keller with the teachings of Petzold by replacing the coil spring 26 with a plate spring positioned between the armature plate

19 and the coil 16 such that the plate spring would be positioned to surround and outer end portion of the collar 18 as defined in the claim (See Office Action dated February 26, 2008, Page 6, lines 4-8). The examiner argues that such a modification would allow for easier access to the spring for maintenance and removal. Appellant respectfully disagrees.

Keller is directed to providing a pre-assembled bushing unit 10 that is installed within a housing (see claim 1). The bushing unit includes the sliding sleeve 18, magnet 16, and plates 14, 15, 19 (see Figure 1). The coil spring 26 is externally mounted to react between a gear 28 and the sliding sleeve 18. Once the pre-assembled bushing unit is removed from the housing, the spring is immediately accessible for maintenance operations. Contrary to the examiner's assertion, making the examiner's proposed modification would make it more difficult to access the spring, i.e. maintenance and removal of the spring would not be easier than that which is already provided by Keller.

The examiner argues that while Keller does provide one possible reason for locating the spring 26 in a position between the collar and hub, Keller does not expressly state that the spring cannot be located between a coil and washer as proposed by the examiner. Keller does not need to expressly state this, all Keller needs to do is teach away from the proposed modification. Keller clearly teaches away from the proposed modification. As stated by the United States Supreme Court, "when the prior art teaches away from combining certain know elements, discovery of a successful means of combining them is more likely to be non-obvious" (KSR Int'l Co. v. Teleflex, Inc. et al., 127 S.Ct. 1727 (2007)).

The examiner argues that Keller does not provide any indication that rearranging the spring to the examiner's proposed position would render Keller as being useless or be a detrimental design choice. Appellant respectfully asserts that the examiner's proposed modification would be detrimental to the Keller configuration.

Keller specifically states that the spring is arranged between the sliding sleeve 18 and the opposing hub collar 23 to ensure that when no current is flowing through the magnet that the drive gears will not accidentally engage. See col. 2, lines 57-60. The examiner's proposed modification would clearly defeat the beneficial features that are provided by Keller's present spring configuration.

Finally, the examiner has argued that the proposed modification would allow for easier access to the spring for maintenance and removal. This clearly is not supported by the references. The entire purpose of Keller is to provide a pre-assembled bushing unit 10 that is easily installed within a housing (see col. 1, lines 46-59). When this pre-assembled unit is removed, the spring 26 is immediately accessible for maintenance and removal. The examiner's proposed modification would place the spring within the pre-assembled unit, which would then have to be separately disassembled to access the spring, once the unit is removed from the housing.

Thus, appellant respectfully asserts that claim 1 is allowable over the recited combination of references.

#### **Claims 2-4**

For the reasons set forth above with regard to claim 1, claim 2 is also allowable. The examiner argues that Keller discloses a coil 16 that is mounted to an axle component. Appellant respectfully asserts that element 16 of Keller is not a coil mounted to an axle component as defined in the claim. Instead, Keller discloses mounting element 16 within the bushing which is part of the locking mechanism itself. Thus, claim 2 is allowable over the recited combination. For similar reasons claims 3-4 are also allowable.

#### **Claim 5**

For the reasons set forth above with regard to claim 2, claim 5 is also allowable. The examiner argues that Petzold does not need to be relied upon to teach the washer being located on the outboard end because this feature is disclosed by Keller. However, Keller does not teach using a spring to react against this washer. The examiner has relied upon Petzold to disclose a different type of spring configuration that is used to replace the spring configuration of Keller.

As shown in Figures 1-2 of Petzold, each of the springs 36, 38, 46 reacts between a fixed electromagnetic device 24, 26, 40 and a disc 22 that is centrally positioned on the shift dog 18. There is no teaching found in Petzold to mount a spring to react between a washer fixed to an end of a shiftable sleeve and a fixed electromagnetic device.

The examiner is arguing that appellant is attacking the references individually; however, appellant responds to this by arguing that the examiner is clearly engaging in a hindsight reconstruction of the claimed invention, using appellant's structure as a template and selecting elements from the references to fill the gaps, which is not permissible under 35 U.S.C. 103(a), (see, for example, In re Gorman, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991)). When viewing the teaches of Petzold and Keller, neither reference discloses positioning the resilient element as defined in claim 5. The only teaching of the claimed configuration is found in appellant's application. Further, as discussed above, Keller clearly teaches away from the examiner's proposed spring location. Thus, claim 5 is allowable over the recited combination.

#### **Claim 6**

For the reason set forth above with regard to claim 5, claim 6 is also allowable. Further, claim 6 recites the structure of a washer that is fixed to the outboard end of the shift collar for reacting with the resilient member.

The examiner argues that Petzold discloses a washer 22 that is to left of center of the collar and therefore Petzold discloses a washer fixed to the outboard end of the shift collar. Appellant respectfully disagrees. Figures 1 and 2 clearly show that the disc 22 is positioned at a central position on the shift dog 18. Contrary to the examiner's assertion, disc 22 is clearly not fixed to an outboard end of shift dog 18. If one of ordinary skill in the art were asked whether disc 22 was positioned centrally on shift dog 18 or if it was fixed to an outboard end of shift dog 18, the clear answer would be that the disc is centrally located. This is further supported by the fact that each end of the shift dog must be able to engage a respective gear element 4, 6. If the disc were mounted to one end of the shift dog 18, the shift dog 18 would not be able to operate as intended.

Thus, claim 6 is allowable over the recited combination.

### **Claims 7-8**

For the reasons set forth above with regard to claim 2, claim 7 is also allowable. The examiner argues that claim 7 merely recites that the shift collar has “an outboard end for supporting said resilient member” and that this is merely an intended use. Appellant respectfully disagrees. Claim 7 also includes the limitation that the resilient member surrounds this outer end portion of the shift collar (referring back to claim 1 from which claim 7 ultimately depends.).

Keller discloses a sleeve 18 with a splined surface at one end but this sleeve does not have a reduced diameter portion that supports a resilient member as claimed. Petzold discloses a shift dog 18 that has the same outer diameter dimension at both ends. The shift dog includes a center notch with disc 22. As such, neither reference discloses, suggests, or teaches the combination of a shift collar having a smaller diameter at one end that supports a resilient member. Thus, claim 7 is allowable over the recited combination. For similar reasons claim 8 is also allowable over the recited combination.

### **Claims 9-10 and 17-18**

Claim 9 recites the features of a differential including a differential gear assembly supported by a differential case, and wherein the ring gear is attached to the differential case to drive the differential gear assembly with the shift collar moving into locking engagement with the differential case to achieve a locked position.

The examiner argues that the case of Keller is formed in two parts, ring gear section 24 and housing section C, and further argues that the collar 18 engages the ring gear section 24. Claim 9 recites that the ring gear is attached to the differential case but the examiner has argued that the ring gear is the differential case. For the reasons set forth above with regard to claim 1, Keller does not disclose a differential having a differential case that is locked to a shift collar as claimed, see Figure 1. Instead, Keller teaches that element 24 comprises a clutch wheel with a hub 23 that engages with a sliding sleeve 18. The clutch wheel 24 does not comprise a differential case and one of ordinary skill in the art would not consider it to be so.

Further, claim 9 recites that the resilient member surrounds the shift collar and reacts between the electronic actuator and the shift collar. For the reasons set forth above, neither reference discloses this claimed combination of features.

Finally, for the reasons set forth above with regard to claim 1, appellant respectfully asserts that Keller teaches away from the examiner's proposed modification. Thus, claim 9 is allowable over the recited combination. For similar reasons claims 10 and 17-18 are also allowable.

#### **Claim 12**

For the reasons set forth above with regard to claim 9, claim 12 is also allowable. Further, claim 12 recites the feature of a washer that is fixed to an outboard end of the shift collar such that the resilient member reacts between the washer and the coil, and with the coil being positioned axially between the inboard end of the shift collar and the washer.

The examiner argues that Petzold discloses a washer 22 mounted to a shift collar 18 which is located left of center and thus is considered to be at the outboard end. Appellant respectfully disagrees. As discussed above with regard to claim 6, the location of this element 22 is not at either end of the shift dog 18. Instead, Petzold teaches a central mounting of disc 22 that facilitates the ability of the shift dog to move equally toward opposite gear engagements in combination with providing a neutral (non-engaged) position axially between the two opposing gears. See col. 2, line 51 through col. 3, line 17; and col. 3, lines 52-63. Thus, claim 12 is allowable because the combination of references does not disclose, suggest, or teach the claimed invention.

#### **Claim 13**

The examiner argues that rearranging of the spring location based on the teachings of Petzold would not destroy the function of Keller. This is a mis-characterization of appellant's argument. Appellant is arguing that the proposed modification would render the prior art unsatisfactory for its intended purpose (see MPEP 2143.01 (V)). If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then

there is no suggestion or motivation to make the proposed modification. In re Gordon, 7233 F.2d 900, 221 USPOQ 1125 (Fed. Cir. 1984). For the reasons set forth above with regard to claim 1, appellant respectfully assert that Keller teaches away from the proposed modification and that the proposed modification would render Keller unsatisfactory for its intended purpose.

Further, claim 13 recites that the resilient member reacts between the coil and a washer mounted to the outboard end of the shift collar. As discussed above with regard to claim 12, neither Keller nor Petzold discloses or suggests this feature. Instead, as discussed above with regard to claims 6 and 12, Petzold teaches away from such a configuration by disclosing a beneficial configuration where a disc 22 is centrally mounted on a shift dog 18. Thus, claim 13 is also allowable over the recited combination for this additional reason.

#### **Claims 14-16**

For the reasons set forth above with regard to claim 13, claim 14 is also allowable. The examiner argues that shift collar 18 of Keller engages with the case half formed by the ring gear 24. Keller does not disclose direct engagement between a differential case half and a shift collar as claimed, see Figure 1. Claim 14 recites a differential case that has first and second case halves in combination with a ring gear attached to the differential case. Claim 14 also recites that the shift collar directly engages one of the case halves. The examiner has identified a ring gear 24 and a differential case C; however, the shift collar 18 does not engage differential case C and instead engages the ring gear.

Thus, claim 14 is allowable over the recited combination. For similar reasons claims 15-16 are also allowable over the recited combination.

#### **Claim 19**

For the reasons set forth above with regard to claim 17, claim 19 is also allowable. Further, claim 19 is also allowable for the reasons set forth above with regard to claim 14.



**Claim 20**

For the reasons set forth above with regard to claim 17, claim 20 is also allowable. Further, claim 20 is also allowable for the reasons set forth above with regard to claims 6 and 12.

**Claim 24**

For the reasons set forth above with regard to claim 1, claim 24 is also allowable. Further, claim 24 recites that the shift collar includes a first end having a splined surface to engage a mating splined surface of the differential case and a second end opposite of the first end, with the first end having a greater diameter than the second end, and wherein a washer is fixed to the second end such that the resilient member reacts between the washer and the electronic actuator.

Keller does not disclose the claimed washer that is fixed to an end of the shift collar and that reacts with the resilient member. The examiner argues that Keller discloses a washer 19 that is fixed to an end of the shift collar; however, there is no teaching that this element serves as a reacting member for a spring. Petzold also does not disclose or teach mounting a washer to an end of a shift collar having a greater diameter at one end than the other, where the washer comprises a reacting element for a spring.

The shift dog in Petzold is defined by a common diameter at each end and includes a central notch that receives the disc. Thus, Petzold teaches away from mounting a washer to one end of a shift collar that has a smaller diameter than the end of the shift collar that has the splined surface. The examiner argues that the disc is mounted to an end of the shift collar as claimed; however, for the reasons set forth above with regard to claims 6 and 12, Petzold clearly teaches away from positioning the washer at such a location as this would render the shift dog incapable of functioning as intended. Thus, claim 24 is allowable over the recited combination because the references do not disclose, suggest, or teach the claimed invention.

**Claim 25**

For the reasons set forth above with regard to claim 24, claim 25 is also allowable. Further, claim 25 recites that the electronic actuator includes a coil that is positioned axially between the first end and the washer, and wherein the resilient member is positioned axially between the washer and the coil. None of the references disclose, suggest, or teach the features set forth in claim 25.

Keller does not disclose a resilient member that is positioned axially between a washer mounted at one end of a shift collar and a coil. Petzold teaches locating a disc 22 at a central location on a shift dog 18. Further, Petzold teaches positioning an electromagnetic device 40 at an end of the shift dog 18 with a spring plate 46 positioned to react between the device 40 and the centrally located disc 22. Thus, neither reference discloses a spline surface at one end, a washer fixed to an opposite end, and a resilient member that is positioned between a washer and coil as claimed. Thus, claim 25 is allowable over the recited combination.

**Claim 27**

For the reasons set forth above with regard to claim 13, claim 27 is also allowable. Further, claim 27 recites that the coil is positioned axially between the inboard end and the washer. For the reasons set forth above with regard to claim 25, the references do not disclose, suggest, or teach this feature.

**B. Obviousness Rejection – Keller, Petzold, and Fogelberg**

Claims 11 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Keller (US 5030181) in view of Petzold (US 6886425) and further in view of Fogelberg (US 4561520).

**Claim 11**

For the reasons set forth above with regard to claim 10, claim 11 is also allowable. Further, claim 11 recites the feature of an axle housing for substantially enclosing the carrier and the pair of axle shafts wherein the coil includes mount portions to receive fasteners to directly secure the coil to the axle housing.

The examiner argues that Keller discloses the magnet as sitting against inner annular shoulder 12 and that Fogelberg teaches securing an electromagnetic coil through the use of fasteners. First, Keller teaches mounting the magnet against inner shoulder 12 which is part of bushing 10 (including the sliding sleeve 18, magnet 16, and plates 14, 15, 19) that is pre-assembled as completely as possible (see col. 1, lines 46-57 and col. 5, lines 10-16) to facilitate installation. The bushing 10 is installed as a pre-assembled unit within housing 2. As the magnet is internal to the bushing, Keller does not disclose a coil that is directly secured to an axle housing as claimed.

Second, Fogelberg also does not disclose mounting a coil directly to an axle housing as claimed. The examiner argues that Fogelberg discloses securing an electromagnetic coil through the use of fasteners; however, the coil of Fogelberg is not directly secured to an axle housing as defined in the claim. Fogelberg discloses a transfer case 1 with a transfer case housing 12. Coil 48 of the transfer case clutch is attached to the transfer case housing with fasteners. Fogelberg does not disclose directly mounting a coil to an axle housing as claimed. As such, none of the references disclose or teach directly mounting a coil to an axle housing as set forth in claim 11.

Further, modifying Keller in the manner proposed by the examiner would require that magnet 16 be removed from the pre-assembled unit 10 such that it could be mounted to an axle housing. The examiner disagrees arguing that a magnetic coil that is attached to a housing with fasteners is fully capable of being separately installed as a unit within a housing as stated in Keller. Appellant respectfully disagrees.

Keller states that the problem to be solved by the invention is “essentially to provide an insert bushing which can be pre-assembled as completely as possible . . . (col. 1, lines 46-48)” to facilitate installation such that the housing need not be modified (col. 5, lines 15-16). The pre-assembled bushing includes the magnet 16. Removing the magnet 16 from the bushing

such that the magnet could be directly attached to the housing would: 1) make the bushing assembly less complete; 2) increase the number of assembly steps as the magnet would then have to be separately installed; and 3) requires modifications to the housing such that the magnet can be attached to the housing. The examiner's assertion that a coil that is attached to a housing with fasteners is fully capable of being separately installed as a unit with the housing fails to acknowledge that Keller's beneficial arrangement specifically teaches away from the proposed modification.

Thus, claim 11 is allowable over the recited combination because Keller teaches away from the proposed modification.

**Claim 26**

For the reasons set forth above with regard to claim 1, claim 26 is also allowable. Further, claim 26 recites that the electronic actuator includes a coil having mount portions to receive fasteners to directly attach the coil to a carrier housing. Keller and Petzold do not disclose a coil having mount portions as claimed. Further, Keller and Petzold do not disclose directly mounting a coil to a carrier housing. The coil in Keller is clearly mounted within bushing unit 10. The examiner relies on Fogelberg to teach this feature; however, for the reasons set forth above with regard to claim 11, Fogelberg does not disclose directly attaching a coil to an axle housing and Keller teaches away from the proposed modification. Thus, claim 26 is allowable over the recited combination.

**CONCLUSION**

For the reasons set forth above and in the Appeal Brief, the rejection of all claims is improper and should be reversed.

Respectfully submitted,

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Dated: July 27, 2009